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LIFE HISTORY AND CONTROL STUDIES
LODGEPOLE PINE NEEDLEMINER (RECURVARIA MILLERI BUSCK.)

Season 1939

by

J. S. Yuill
Berkeley, California
February 20, 1940

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Forest Insect Laboratory
Berkeley, California
February 13, 1940

LIFE HISTORY AND CONTROL STUDIES
LODGEPOLE PINE NEEDLEMINER (RECURVARIA MILLERI BUSCK.)

Season 1939

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The only work carried on with this insect during the 1939 season consisted of a few observations on the activity in the Forsyth area and a small scale spray test near Bell Dome. This memorandum is intended to serve as a station record rather than as a seasonal report.

GENERAL OBSERVATIONS

Observations were made in the Forsyth area on May 25, July 4, and August 11. At the time of the first examination it was found that the spring migration of the larvae that precedes pupation had just been completed, indicating that this event had taken place at about the usual time despite the fact that the season was four to five weeks earlier than usual. On July 4 the first adults were just emerging; about 80 percent of the individuals were still in the pupal stage. When the area was last visited, August 11, the flight of adults had apparently just ended. The eggs were found to be in all stages of incubation from ones recently deposited to others in which the larvae were fully formed and moving about within the chorion.

To check on the number of parasites present, a sample of infested needles collected July 4 were taken to the field station and placed in emergence cages. Emergence was as follows:

Parasites	Needleminer Adults	Ratio
73	176	1:2.4

This sample is probably too small to be representative, but the counts indicate that the needleminer in this area is increasing more rapidly than the parasites, for in the previous flight it was found that the ratio was approximately 1:1. This may explain, in part, the apparent increase in aggressiveness of the infestation that has taken place in the last two years. A more detailed account of the infestation trend will be given in the report on the survey of the needleminer plots.

CONTROL TESTS

A recheck of the trees in the Forsyth spray plot was made on May 25. The estimate of the effectiveness of the various insecticides was virtually the same as that made last year. Inverted lead arsenate with nicotine gave the best protection; fast breaking oil emulsions with and without lead arsenate were also good. The other formulae have been eliminated from further consideration because of low toxicity, poor coverage, foliage injury, or excessive cost.

On August 30 further test sprays were applied to 10 pole sized trees at the foot of Bell Dome near the Cathedral Lake apron. The infestation here is not heavy but the area is much more accessible than Forsyth. The following formulae were selected and hand equipment used for the application:

Tree Number	Formula*		Coverage
1 & 2	Lead arsenate	4 pounds	Good deposit on needles; not heavy around bases.
	Light medium oil	2 quarts	
	Nicotine sulphate (40%)	1 pint	
	"Dynamite" spreader	6 ounces	
3	Diesel oil emulsion**	4 %	Good wetting; run-off very high; light deposit.
	Nicotine sulphate (40%)	1 pint	
4	Thiocyanate (Loro)	1:1000	Poor coverage
	Light medium oil	1 %	
	Blood albumin	4 ounces	
	Liquid spreader (Grasselli)	12 ounces	
5 & 6	Light medium oil	4 %	Leaves a good, even deposit on breaking; wets around basal scales well.
	Nicotine sulphate (40%)	1 pint	
	Blood albumin	4 ounces	
	Liquid spreader (Orhto)	1 pint	
7 & 8	Cryolite (synthetic)	3 pounds	Not as good a deposit as lead arsenate.
	Nicotine sulphate (40%)	1 pint	
	Light medium oil	2 quarts	
	"Dynamite" spreader	6 ounces	
9 & 10	Heavy oil and emulsifier (Fungicide adhesive)	1 %	Deposit irregular
	Lead arsenate	4 pounds	
	Nicotine sulphate	1 pint	
	Liquid spreader (Orhto)	1 pint	

* All quantities on the basis of 100 gallons of spray mixture
** Stock emulsion 10 parts Diesel oil, 5 parts bentonite, 10 parts water by weight.

Observations to determine the effectiveness of these formulae will be made during the next two seasons. Tests with hand equipment serve only as a rough estimate of the value of the different formulae; valid tests will require the use of power equipment operating at high pressures.

Figure 1. Stand of lodgepole pine east of Bell Dome, Yosemite National Park. This is location of the 1939 test spray applications. (11155a)

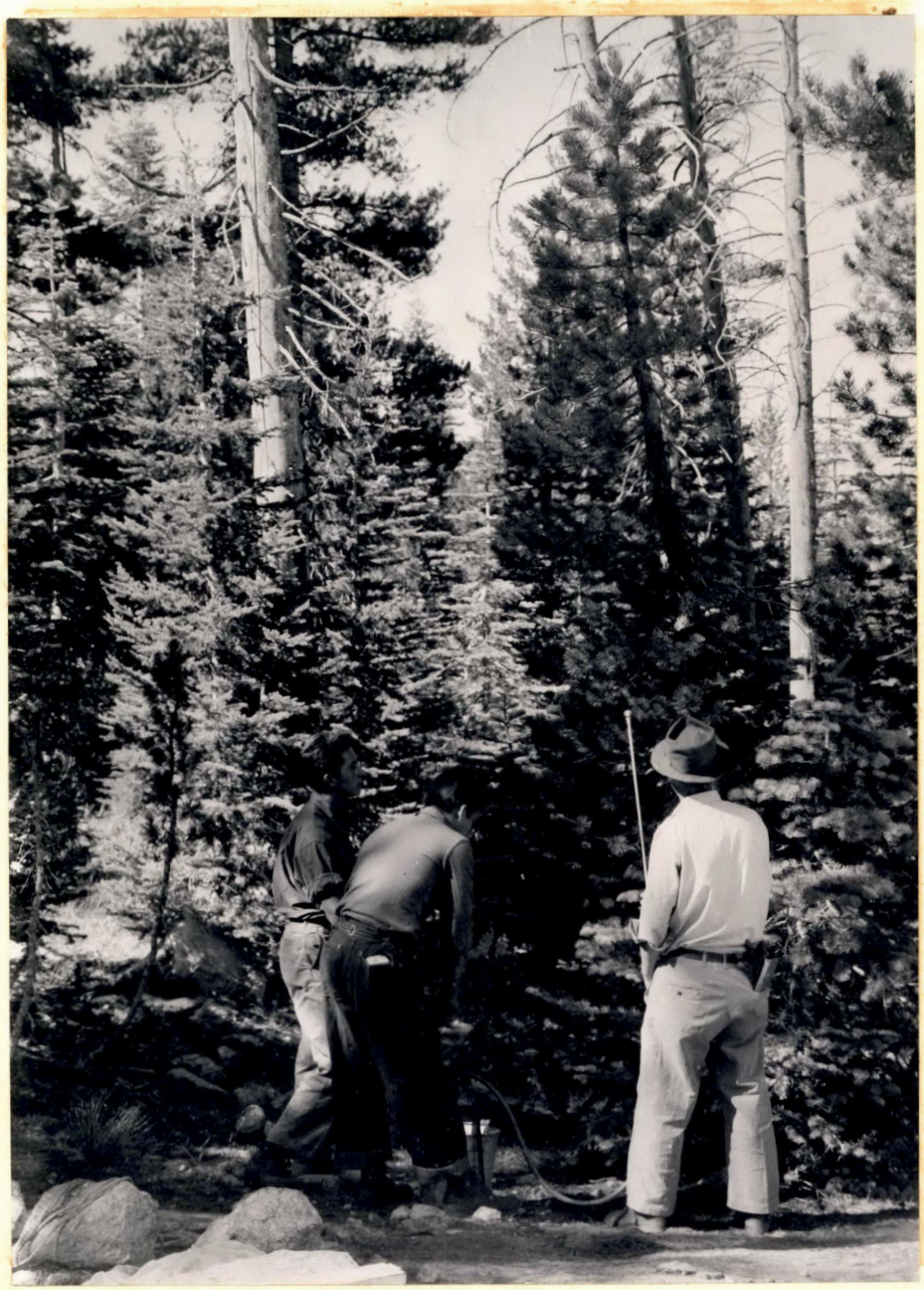

Figure 2. Applying test spray with hand equipment. One man handles nozzle, another works the pump, and the third keeps the spray mixture properly agitated. (111555)